(19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 31 March 2005 (31.03.2005)

PCT

(10) International Publication Number WO 2005/028836 A1

(51) International Patent Classification⁷: F

F02D 41/20,

(21) International Application Number:

PCT/GB2004/004067

(22) International Filing Date:

23 September 2004 (23.09.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 03255965.0 23 September 2003

23 September 2003 (23.09.2003) El

- (71) Applicant (for all designated States except US): DELPHI TECHNOLOGIES, INC. [US/US]; P.O. Box 5052, Troy, MI 48007 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): MARTIN, Steven, J. [GB/GB]; 26 Herne Bay Road, Sturry, Canterbury, Kent CT2 0NJ (GB).
- (74) Agents: HOPLEY, Joanne, Selina et al.; David Keltie Associates, Fleet Place House, 2 Fleet Place, London EC4M 7ET (GB).

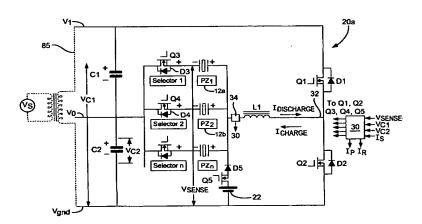
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: A DRIVE CIRCUIT FOR AN INJECTOR ARRANGEMENT



(57) Abstract: A drive circuit (20a, 20b) for an injector arrangement having at least one piezeoelectric injector (12a, 12b) is described. The drive circuit comprises: a first charge storage means (C2) for operative connection with the injector (12a, 12b) during a discharging phase so as to discharge current to flow therethrough, thereby to initiate an injection event; a second charge storage means (Cl) for operative connection with the injector (12a, 12b) during a charging phase so as to cause a charging current to flow therethrough, thereby to terminate the injection event; a switch means (Q1, Q2) for controlling whether the first charge storage means (C2) is operably connected to the injector or whether the second charge storage means (Cl) is operably connected to the injector; a first voltage supply rail at a first voltage level; a second voltage supply rail at a second voltage level higher than the first; a voltage supply means (22, 36); and regeneration switch means (Q5, Q2, L1) operable at the end of the charging phase to transfer charge from the voltage supply means to at least the second charge storage means (Cl) via an energy storage device (L1) prior to a subsequent discharging phase.

WO 2005/028836 A1



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.